

### **REMARKS**

The Official Action mailed October 17, 2007 has been carefully considered. Claims 1-3 and 5-14 stand rejected. Presently, claims 1 and 13 have been amended and claims 6, 9 and 12 have been cancelled. Reconsideration and allowance of the subject application, as amended, are respectfully requested.

#### **Claim Amendments**

Claim 1 has been amended to recite: "dissolving or dispersing said thiol compound in a solvent and preparing a solution or dispersion including 20 to 50 mM of the thiol compound, and treating said metal with said solution or dispersion in the range of 3 to 11 seconds." Support for this amendment may be found in paragraph [0041] of the published specification, which recites: "[i]n a preferred embodiment, alkanethiol solutions are used in the range of 20 to 50 mM." In addition, support for this amendment may be found in paragraph [0042] of the published specification, which recites: "[i]t has been shown however, that dipping times in the range of 3 to 11 second are satisfactory." No new matter is believed to be entered by this amendment. Claim 13 has been similarly amended.

#### **Rejections Under 35 USC §102**

Claims 1-2 and 7-11 stand rejected under 35 USC §102(e) as being anticipated by Reihs et al., U.S. Patent No. 6,652,669.

As an initial matter, as previously discussed in the Response of October 31, 2007, it is respectfully asserted that Reihs discloses providing a hydrophobic or oleophobic coating on a sealed aluminum support material. Therefore, on this basis alone, it is respectfully asserted that Reihs fails to disclose the presently claimed subject matter.

However, in addition to the above, claim 1, as amended, is now directed to dissolving or dispersing a thiol compound in a solvent and preparing a solution or dispersion including 20 to 50 mM of the thiol compound and treating the metal with the solution or dispersion in the range of 3 to 11 seconds. Reihs does not appear to disclose providing a thiol solution, wherein the thiol

is present in the range of 20 to 50 mM and treating the metal with the solution in the range of 3 to 11 seconds.

Furthermore, it is noted that Reihs does not render obvious the presently claimed subject matter. Other than in specific examples, (See, e.g., Examples 1, 5, 9 and 11) Reihs does not provide any guidance as to an appropriate concentration of n-decanethiol to achieve desired ultraphobicity<sup>1</sup> and in the specific examples, the concentration of the n-decanethiol appears to be 1g/l, which may be about 5-6 mM and well outside the range presently claimed for providing corrosion resistance.

In addition, Reihs does not appear to provide any guidance as to how long of a treatment time should be utilized. Once again, referring to specific examples, it would appear that an appropriate treatment time is 24 hours. See again Examples 1, 5, 9 and 11. There is no guidance to provide treatment times of less than 24 hours and furthermore, as Reihs is looking to develop an ultraphobic surface, it may be questionable as to whether treatment times of less than 24 hours would be sufficient to provide an ultraphobic surface. Therefore, it is respectfully asserted that the presently claimed subject matter defines over Reihs.

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Claims 1-3, 5-11 and 13-14 stand rejected under 35 USC §102(b) as being anticipated by JP 10-001784.

As noted above, claim 1, as amended, is now directed to dissolving or dispersing a thiol compound in a solvent and preparing a solution or dispersion including 20 to 50 mM of the thiol compound and treating the metal with the solution or dispersion in the range of 3 to 11 seconds. JP '784 does not appear to disclose providing a thiol solution in the range of 20 to 50 mM and treating the metal with the solution in the range of 3 to 11 seconds.

Furthermore, it is noted that JP '784 does not render obvious the presently claimed subject matter. The reference appears to only disclose treating a galvanized steel sheet with a 5 mM solution of a thiol for the provision of lubricity and stain resistance. See, JP '784 paragraph 0001 of the Detailed Specification. Once again, this concentration appears to be well outside the

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<sup>1</sup> Reihs being directed to "producing an ultraphobic surface." Abstract.

range presently claimed for providing corrosion resistance. In addition, the JP '784 reference does not appear to provide any guidance as to how long of a treatment time should be utilized. A treatment time is simply not disclosed. Therefore, it is respectfully asserted that the presently claimed subject matter defines over JP '784.

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Claims 1-2 and 7-11 stand rejected under 35 USC §102(b) as being anticipated by Nozawa, et al., (Corrosion Science, 39(9), pp 1625-1639, 1997).

As an initial matter, as previously discussed in the Response of October 31, 2007, it is respectfully asserted that Nozawa discloses providing surface thiolates on an iron surface, i.e., Fe(100). Therefore, on this basis alone, it is respectfully asserted that Nozawa fails to disclose the presently claimed subject matter.

In addition and as noted above, claim 1, as amended, is now directed to dissolving or dispersing a thiol compound in a solvent and preparing a solution or dispersion including 20 to 50 mM of the thiol compound and treating the metal with the solution or dispersion in the range of 3 to 11 seconds. Nozawa does not appear to disclose providing a thiol solution in the range of 20 to 50 mM and treating the metal with the solution in the range of 3 to 11 seconds.

Furthermore, it is noted that Nozawa does not render obvious the presently claimed subject matter. Nozawa appears to only disclose providing a  $5 \times 10^{-3}$  solution of an alkanethiol  $C_nT$  for treating the iron surface, well outside the range presently claimed for providing corrosion resistance. In addition, Nozawa does not appear to provide any guidance as to how long of a treatment time should be utilized. Nozawa only discloses a 30 minute treatment time, well over the 3 to 11 second treatment time claimed herein. Therefore, it is respectfully asserted that the presently claimed subject matter defines over Nozawa.

Applicants also note the following with respect to the above. In rejecting claim 12 under 35 USC §103(a) as being unpatentable over JP 10-001784, the Office Action recites: “‘784 fails to teach the length of time for the dipping process, but it would have been obvious to optimize the length of time because the dipping time is known to be a parameter that is important to

control in a coating step.” *Office Action*, page 6 (October 17, 2007). However, in making an obvious rejection, there must also be a reasonable expectation of success in the proposed modification. See MPEP§2143.02.

It is completely unclear from the cited references that the presently claimed treatment times would be an appropriate modification to the disclosures of Reihs, Nozawa and the ‘784 reference leading to a reasonable expectation of success. More specifically, Reihs discloses coating a sheet of AlMg<sub>3</sub>, including a 50nm-thick gold layer, in a solution of 1g/l n-decanethiol in ethanol at room temperature for 24 hours. The result is a static contact angle for water of >150°. Nozawa discloses that coating iron in a solution of  $5 \times 10^{-3} \text{M}$  of C<sub>n</sub>T, wherein n = 12-16, in ethanol for 30 minutes, resulting in a contact angle in the range of 100.5 to 119.7. This data would appear to indicate that the reduction in treatment time, from 24 hours to 30 minutes, may lead to the greatly reduced contact angle of Nozawa.

Accordingly, upon reviewing this data, one may therefore believe that a treatment of 3-11 seconds may result in a further drop in contact angle in comparison to the results of Reihs and Nozawa. Thus, the short treatment time may have no useful result on increasing corrosion resistance, being a function of contact angle. Therefore, one might even suggest that the data teaches against the presently claimed subject matter. Accordingly, in addition to the reasons asserted above, it is believed that the presently claimed subject matter is not rendered obvious as a reasonable expectation of success does not appear to exist given the data presented in the collection of references cited herein.

#### Rejections Under 35 USC §103

Claims 3 and 12 stand rejected under 35 USC §103(a) as being unpatentable over Reihs, et al., U.S. Patent No. 6,652,669. Claim 12 stands rejected under 35 USC §103(a) as being unpatentable over JP 10-001784. Claims 3 and 12 stand rejected under 35 USC §103(a) as being unpatentable over Nozawa, (Corrosion Science, 39(9), pp 1625-1639, 1997).

As claim 3 depends from independent claim 1, it is respectfully asserted that claim 3 defines over the cited references. It is also noted that claim 12 has been cancelled.

Having dealt with all the objections raised by the Examiner, it is respectfully submitted that the present application, as amended, is in condition for allowance. Thus, early allowance is earnestly solicited.

If the Examiner desires personal contact for further disposition of this case, the Examiner is invited to call the undersigned Attorney at 603.668.6560.

In the event there are any fees due, please charge them to our Deposit Account No. 50-2121.

Respectfully submitted,

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